

REMARKS

Applicant has amended claims 1, 10, 17, 25, 29, and 33 as set forth above. In view of the above amendments and the following remarks, reconsideration of the outstanding office action is respectfully requested.

The Office has rejected claims 1-3, 6, 8-12, 15-20, 23, 25-27, 29-31, 33-36, and 38-45 are rejected under 35 U.S.C. 102(e) as being anticipated by US Patent No. 6,686,961 to Kubo et al. (Kubo), claims 4, 5, 13-14, 21-22, 28, 32 and 37 under 35 U.S.C. 103(a) as being unpatentable over Kubo et al in view of what the Office asserts is Applicant's conceded prior art, and claims 7, 24 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kubo et al in view of US Patent No. 5,805,213 to Spaulding et al. (Spaulding). The Office asserts that Kubo discloses providing a digital image (Fig. 3, element 6), with a plurality of channels (fig. 7 shows R, G, and B separated for further processing) with each of the channels comprising a set of pixel data signals, and applying a filter to each of the sets of pixel data signals (34 and 31), and applying a different filter to each of the sets of pixel data signals (col. 7, lines 57+). The Office also asserts that in Fig. 7, Kubo discloses applying a median filter (34) for the set of green pixels, an average-interpolation filter (31) for the set of red pixels, and an average-interpolation filter (31) for the set of blue pixels which the office interprets as different filters to each of the sets of pixel data signals. The Office acknowledges that Kubo et al does disclose adjusting the set radius of pixel data signals in the filter for each of the channels of the digital image based on at least one factor which is a duration of exposure for capturing the digital image, but Applicant's conceded prior art teaches an exposure of 15 seconds (fig. 3) at a set radius. The Office also acknowledges that Kubo does not disclose using a color-space transformation to the sets of pixel signal before the step of applying a filter, but asserts that Spaulding teaches it would be advantageous to use, for example, CIELAB for the purpose of correcting the multi channel signals of the camera system to produce the desired output signals (col. 8, lines 53+; and col. 7, lines 63+).

Kubo, Spaulding, and what the Office asserts is Applicant's conceded prior art, alone or in combination, do not disclose or suggest, "wherein each of the filters is adjusted and applied differently and independently to each of the sets of pixel data signals" as recited in claims 1, 10, 17, 25, 29, and 33. The Office is respectfully directed to FIG. 7 and

to col. 8, line 6-10 in Kubo, which illustrates and states, “Interpolation of the R-pixel and B-pixel are processed by the use of average-interpolation filters 31 (in step #150. For example, the R-pixel signals are processed in the following manner (the B-pixels are processed in the same manner) [Emphasis added]. Accordingly, in Kubo the filters 31 are applied to the R and B pixels in the same manner and there is no teaching or suggestion of adjusting and applying them differently and independently as claimed. Similarly, neither Spaulding nor what the Office asserts is Applicant’s conceded prior art teach or suggest this claimed filtering arrangement.

As disclosed at page 6, lines 2-4, in the above-identified patent application, “[T]he present invention significantly reduces noise through an adaptive filtering technique which adjusts or customizes the filter for each channel of the image.” Additionally, as disclosed at page 9, lines 26-28 in the above-identified patent application, “[T]he image processing system 14 is programmed with a filtering process which customizes the filter for the pixel data signals for each channel.” Further, as disclosed at page 11, lines 19-23 in the above-identified patent application, “By adjusting and applying the median filters independently in each image channel in the imaging system, each filter can be customized to that image plane, eliminating the need to over-filter some planes and/or leaving objectionable artifacts in other planes.” Accordingly, in view of the foregoing amendments and remarks, the Office is respectfully requested to reconsider and withdraw the rejection of claims 1, 19, 25, and 35. Since claims 2-9, 40, and 41 depend from and contain the limitations of claim 1, claims 20-22 depend from and contain the limitations of claim 19, claims 36 and 37 depend from and contain the limitations of claim 35, and claims 26-28 depend from and contain the limitations of claim 25, they are distinguishable over the cited references and are patentable in the same manner as claims 1, 19, 25, and 35.

Kubo, Spaulding, and what the Office asserts is Applicant’s conceded prior art, alone or in combination, do not disclose or suggest, “applying a color-space transformation to the sets of pixel data signals before the step of applying a filter” as recited in claim 7, “transforming the red, green, and blue channels to an achromatic channel and two chrominance channels, wherein the achromatic channel and the two chrominance channels each comprise a set of pixel data signals . . . applying a filter to each of the transformed sets of pixel data signals” as recited in claim 10, “applying a color-space transformation to the sets of pixel data signals before the step of applying a filter” as recited in claim 24, “a

transformation system . . . transforms the red, green, and blue channels to an achromatic channel and two chrominance channels, wherein the achromatic channel and the two chrominance channels each comprise a set of pixel data signals . . . a filter system comprising at least two different filters, each of the filters filtering at least one of the transformed sets of pixel data signals” as recited in claim 29, or “a transformation system coupled to the image sensor apparatus which transforms the red, green, and blue channels to an achromatic channel and two chrominance channels before the filter system applies the filters” as recited in claim 38.

As the Office has acknowledged, Kubo does not disclose using a color-space transformation to the sets of pixel signal before the step of applying a filter. Spaulding discloses at col. 7, lines 63+ and at col. 8, lines 53+ that a color-correction transformation determining process is performed before the signals are output. However, again, nowhere does Spaulding teach or suggest applying a color-space transformation before applying the step of filtering. There simply is no teaching in any of the cited references that applying a color-space transformation to the sets of pixel data signals would be useful before performing the actual filtering process, except from hindsight from the above-identified patent application. As a result, there is no motivation to combine the cited references in the manner suggested by the Office. Like Kubo, neither Spaulding nor Applicant’s allegedly conceded prior art disclose or suggest applying a color-space transformation to the sets of pixel data signals before the step of applying a filter as claimed.

More specifically, as disclosed at page 6, lines 4-6 in the above-identified patent application, “The present invention is able to further improve the quality of the image by applying a color-space transformation before the filtering operation.” Additionally, as disclosed at page 12, lines 2-10 in the above-identified patent application, “The method disclosed here and programmed into the memory 16 for execution by the CPU 18 converts the pixel data signals from red, green and blue channels to an achromatic (luminance) and two chromatic (chrominance) channels before filtering. The transformations allow important optimizations in the filtering process. The subjective percept of ‘sharpness’ is based largely on the high-frequency luminance information in an image, so minimizing filtering in that channel maximizes subjective image quality. More aggressive filtering by the imaging system 10 is then possible in the chrominance channels with less reduction in subjective image quality.” Further, as disclosed at page 16, lines 2-8 in the above-identified patent

application, "Enhanced image quality is evident in Figures 8B, 9B, and 10B, but the improvement in the blue channel shown in Figure 10B is the most dramatic in this particular embodiment. This particular example demonstrates the utility of transforming the image to a luminance/chrominance color space in the imaging system 10 before filtering. The mask/filter technique can be applied directly to RGB image planes to limiting filtering artifacts, but noise reduction is less dramatic." Accordingly, in view of the foregoing amendments and remarks, the Office is respectfully requested to reconsider and withdraw the rejection of claims 7, 10, 24, 29, and 38. Since claims 11-16, 42, and 43 depend from and contain the limitations of claim 10 and claims 30-32 depend from and contain the limitations of claim 29, they are distinguishable over the cited references and are patentable in the same manner as claims 10 and 29.

In view of all of the foregoing, applicant submits that this case is in condition for allowance and such allowance is earnestly solicited.

Respectfully submitted,

Date: November 18, 2005

Gunnar G. Leinberg
Gunnar G. Leinberg
Registration No. 35,584

NIXON PEABODY LLP
Clinton Square, P.O. Box 31051
Rochester, New York 14603-1051
Telephone: (585) 263-1014
Facsimile: (585) 263-1600

CERTIFICATE OF MAILING OR TRANSMISSION [37 CFR 1.8(a)]

I hereby certify that this correspondence is being:

- ☒ deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: Mail Stop RCE, Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450
- ☐ transmitted by facsimile on the date shown below to the United States Patent and Trademark Office at (703) _____

11/18/2005
Date

Sherri A. Moscato
Signature

Sherri A. Moscato
Type or Print Name